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From Bat Ecology to Disease Prevention: Lessons from **BCOMING**, **EBOSURSY**, and Perspectives from **ZOOSURSY**

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Postdoctoral researcher at CIRAD (BCOMING project)

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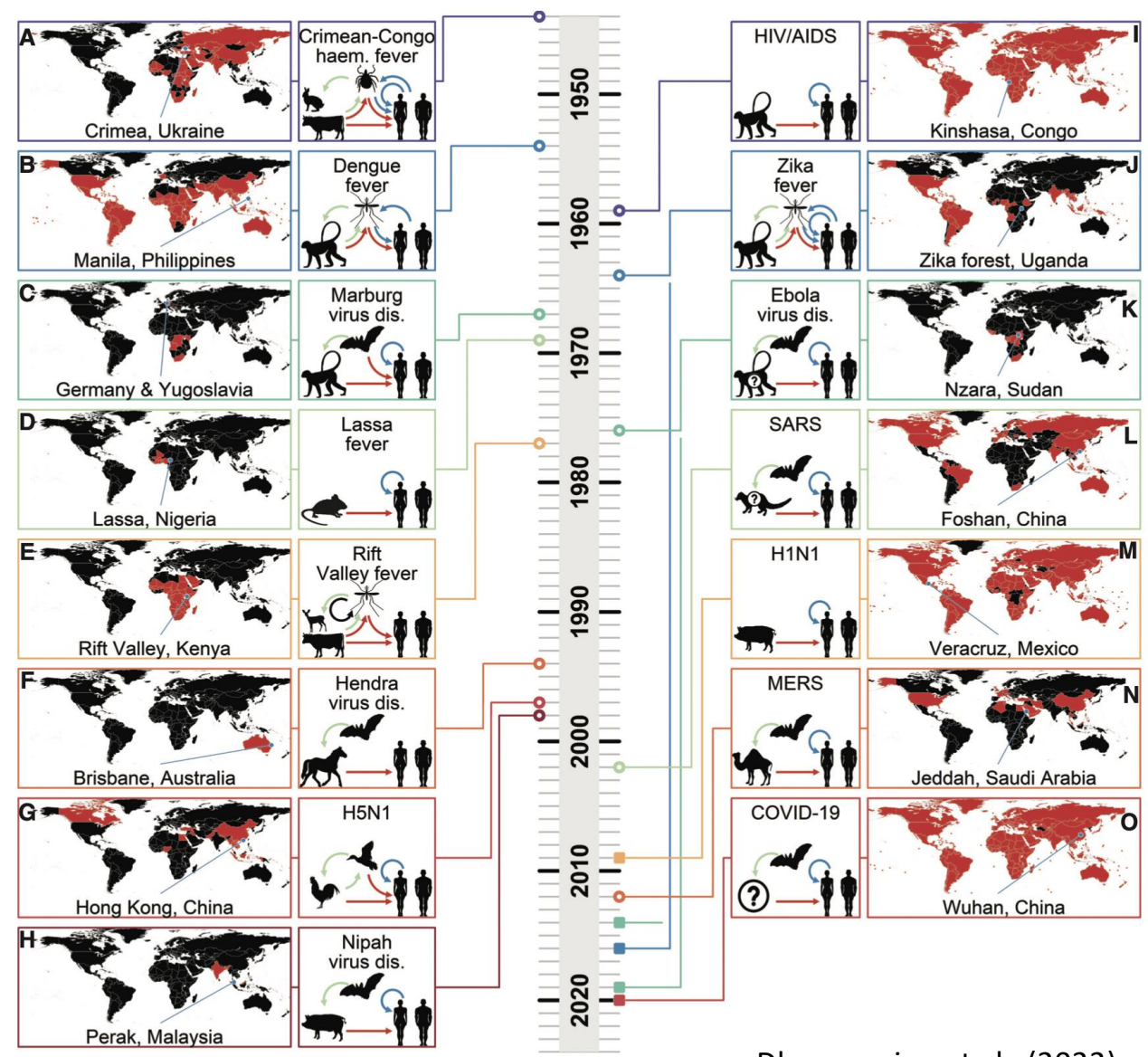
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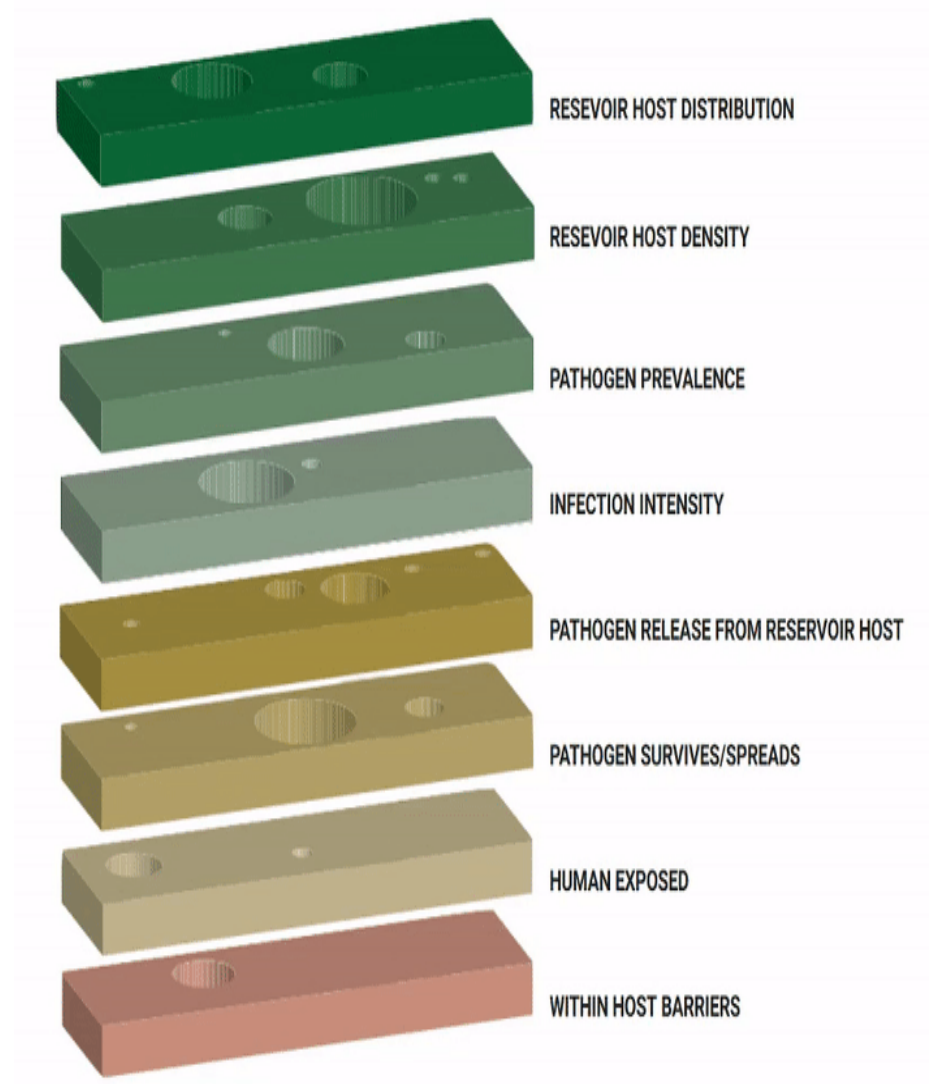


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/01. Context

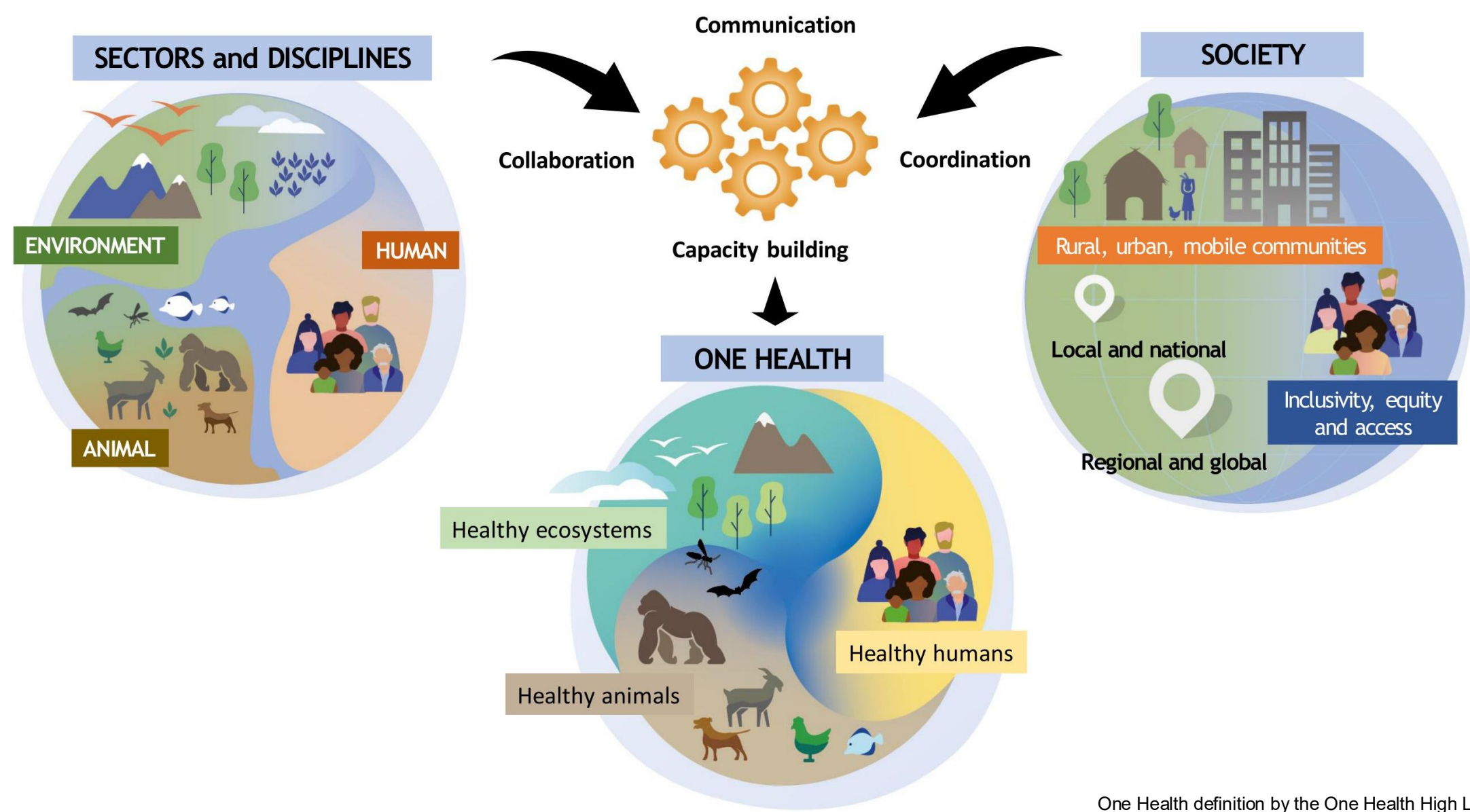


Dharmarajan et al., (2022)



Plowright et al., (2017)

/01. Context



/02. Teams & expertises



M. Bourgarel



H. De Nys



G. Perez



J. Guillebaud



D. Pleydell



J. Cappelle



M. Labadie

How does **bat ecology** (movement ecology, foraging behavior, reproductive phenology, community composition, inter-species interactions, interface bat – wildlife – human...) and **human activities** influence **pathogen** (EbolaV, CoronaV, NipahV, ParamyxoV, AStroV) **transmission** and **maintenance within bat population/communities** and spillover risk to other animal hosts and humans ?

/02. Teams & expertises



Invasive method



Non-invasive method



Laboratory analysis



Modeling (Mechanistic, Bayesian, Spatial, Risk mapping)
& Activity analysis



Training & Awareness

/03. BCOMING project

Biodiversity Conservation to Mitigate the risks of emerging infectious diseases (2022-2026)

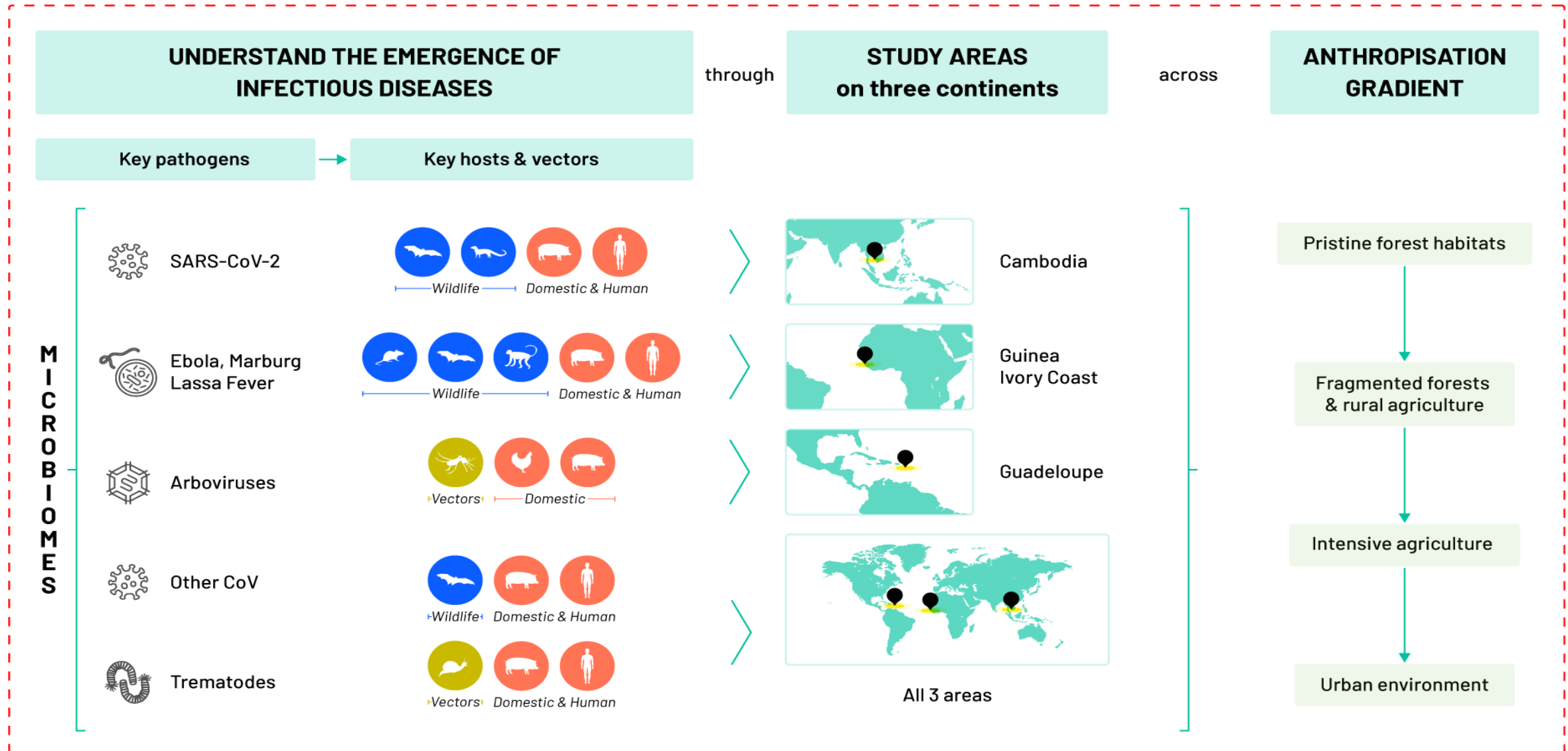


1 – Focus on **biodiversity hotspots** and improve our **understanding** of the ecological and socio-cultural factors involved in disease emergence

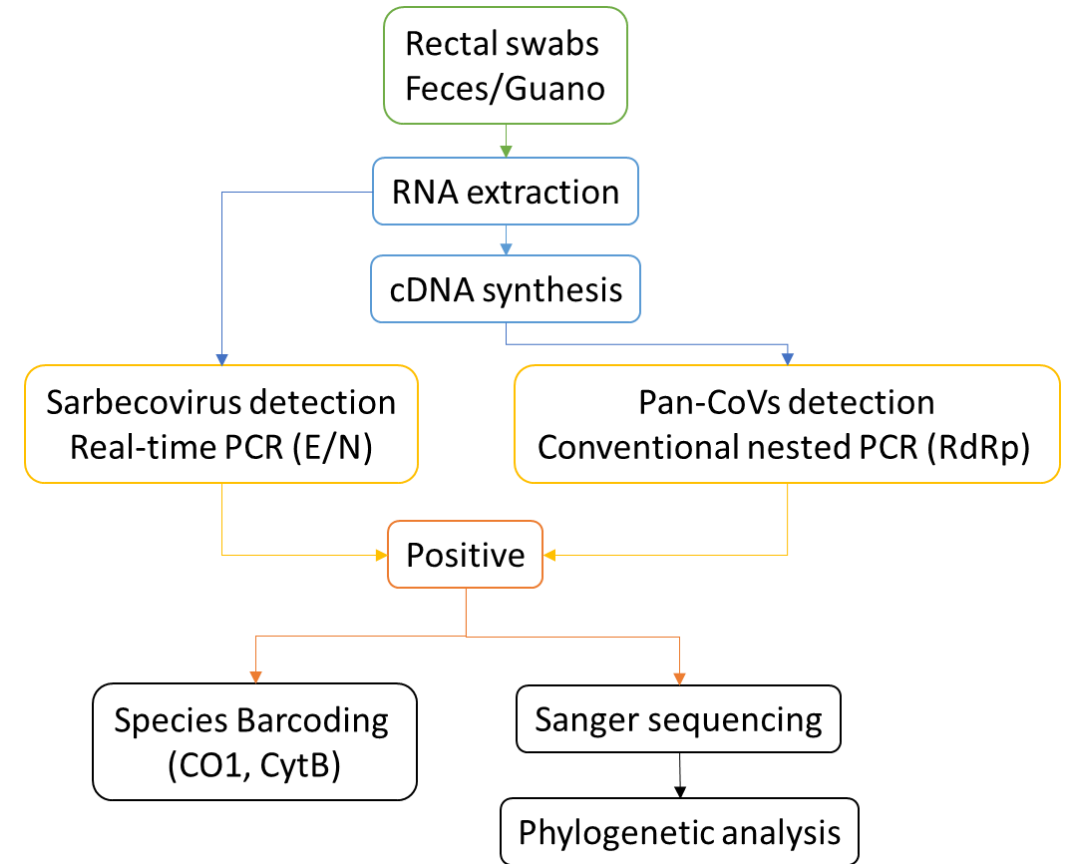
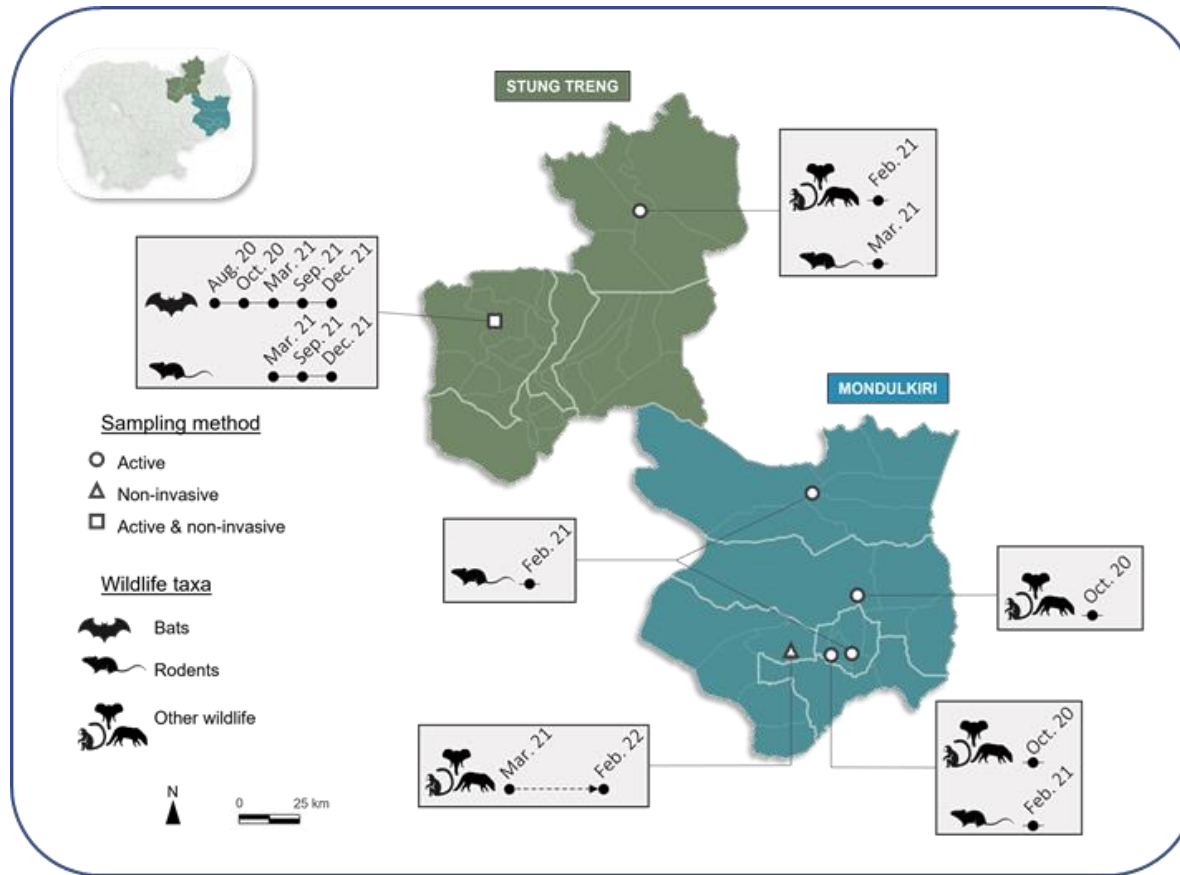
2 – Involve local **citizens and authorities** in the design and implementation of innovative solutions to ensure **sustainability** of the prevention measures.

to **reduce the risk** of infectious disease emergence in three **biodiversity hotspots** by developing a standardised data collection and **analysis** framework to support the **co-construction, with all stakeholders**, of innovative biodiversity conservation strategies and zoonotic disease surveillance.

/03. BCOMING project



/03. BCOMING project – Data collection & testing (N = 2,608)



Adapted from Corman et al., 2019; Quan et al., 2010; Watanabe et al., 2010



Rodent sampling, Stung Treng (Sep. 21)



Bat sampling, Stung Treng (Sep. 21)



Deers at Mayura zoo, Mondulkiri (Oct. 20)

/03. BCOMING project – Main results

Detection of CoVs

- Bats (3.3%) & rodents (2.5%) only
- Alpha- (n=21) & Beta-CoVs (n=29)



R. shameli



T. melanopogon



M. spasma

Possible continuous circulation of SARS-CoV-2-related viruses

- *R. shameli* → persistent viral reservoir? (Delaune et al., 2021)
- Other species → cross-species transmission?

Ms.
Julia Guillebaud



[nature](#) > [scientific reports](#) > [articles](#) > [article](#)

Article | [Open access](#) | Published: 12 April 2025

Study of coronavirus diversity in wildlife in Northern Cambodia suggests continuous circulation of SARS-CoV-2-related viruses in bats

[Julia Guillebaud](#) , [Tey Putita Ou](#), [Vibol Hul](#), [Thavry Hoem](#), [Chana Meng](#), [Sithun Nuon](#), [Sreyleak Hoem](#), [Reaksa Lim](#), [Limmey Khun](#), [Neil M. Furey](#), [Julien Cappelle](#), [Veasna Duong](#) & [Véronique Chevalier](#)

Continuous wildlife-based surveillance

- Longitudinal monitoring of bats populations in the area
 - Viral monitoring (evolution...)
 - Bat ecology (population dynamic...)

Ms. Tey Putita Ou



Characterization and evolutionary history of novel SARS-CoV-2-related viruses in bats from Cambodia

Authors:

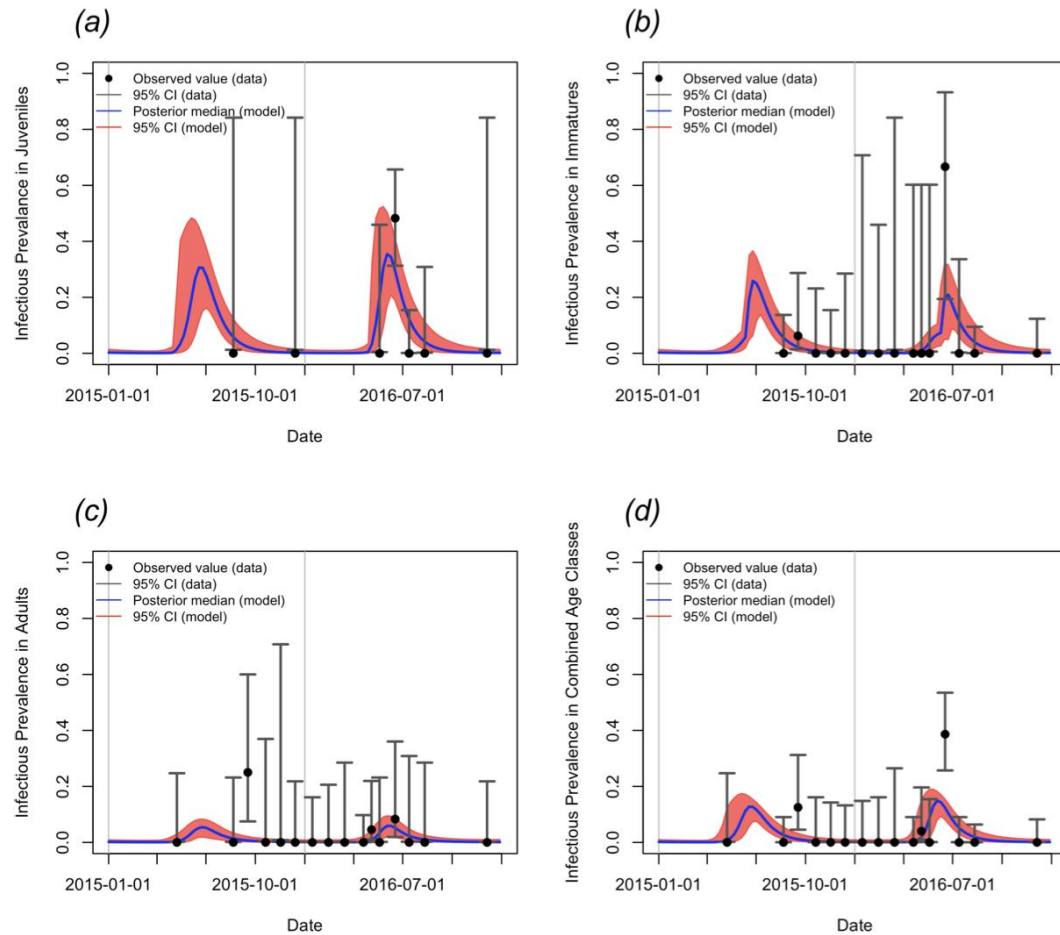
Tey Putita Ou^{1,2*}, Julia Guillebaud¹, Artem Baidaliuk^{2,3}, Sothyra Tum⁴, Dany Chheang⁵, Deborah Delaune², Matthieu Prot², Rafael Rahal Guaragna Machado², Leakhena Pum¹, Vibol Hul¹, Thavry Hoem¹, Sovann Ly², Heidi Auerswald¹, Gavin James Smith⁷, Philippe Dussart⁸, Erik A Karlsson¹, Véronique Chevalier^{8,9,10}, Julien Cappelle⁹, Veasna Duong^{1#}, Etienne Simon-Lorière^{2#}

Ms. Hoem Thavry



“Population dynamic and spatial distribution of *Rhinolophus shameli* bats: contribution to risk assessment of Coronaviruses spillover in Northern of Cambodia”

/03. BCOMING project – Main results



Ms. Cherie Yu



RESEARCH ARTICLES | 28 JAN 2026

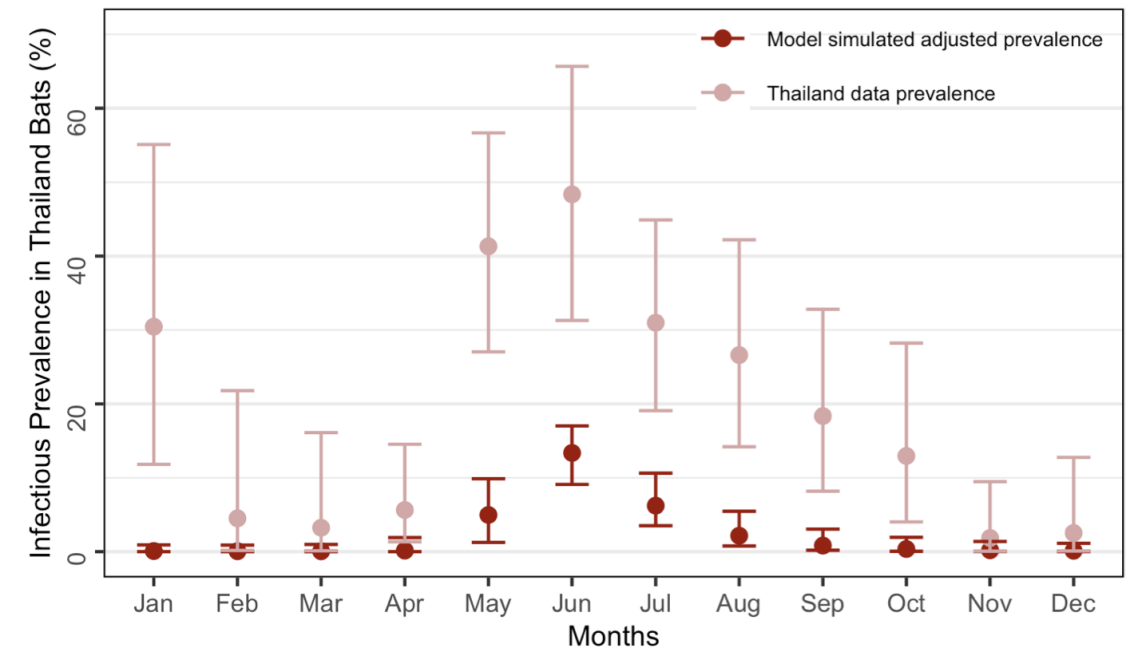
Timing is infectious: eco-epidemiological modelling of *Pteropus lylei* in Cambodia suggests regular annual coronavirus outbreaks in bats

Cherie Yu ; Thavry Hoem; Tey Putita Ou ; Veasna Duong ; Julien Cappelle ; David R. J. Pleydell 

+ Author & article information

Proc Biol Sci (2026) 293 (2063): 20252040 .

<https://doi.org/10.1098/rspb.2025.2040> Article history 



/03. BCOMING project – Perspectives

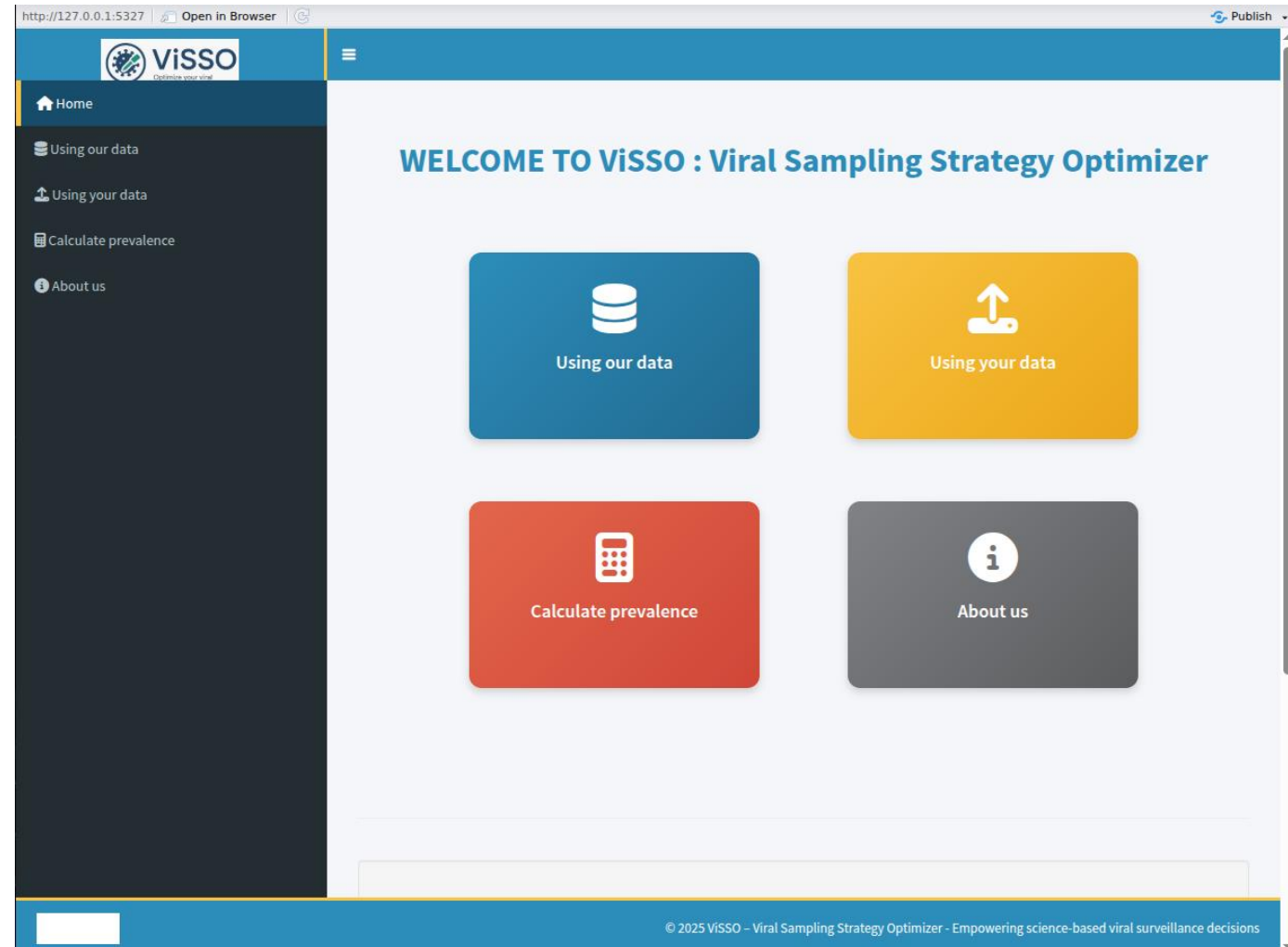
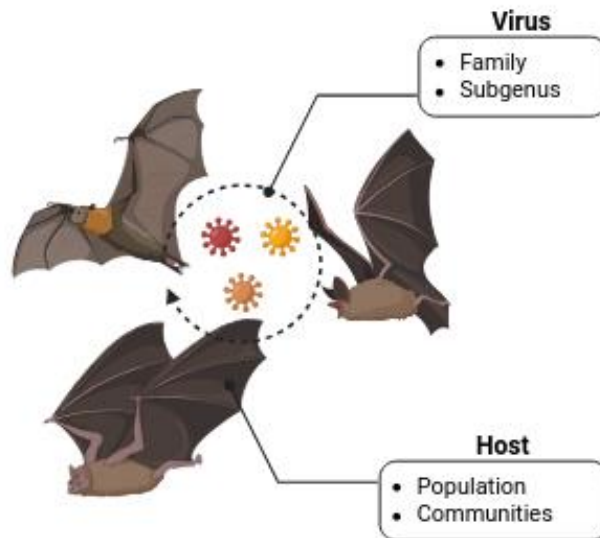


Surveillance goal :

-  1. Presence - Absence
-  2. Prevalence
-  3. Diversity



On different scale :



/04-A. EBOSURSY project

PROJECT

7 YEARS
2017 ▶ 2024

Financed by
THE EUROPEAN UNION



10 COUNTRIES
from West and Central Africa



PROJECT IMPLEMENTERS



World Organisation
for Animal Health
Founded as OIE

In partnership with



ZOONOSSES



**60% OF INFECTIOUS DISEASES
AFFECTING PEOPLE** are of
animal origin, meaning

**6 MAJOR
PATHOGENS
STUDIED**

VIRUSES

- Ebola virus
- Marburg virus
- Rift Valley Fever
- Crimean-Congo Fever
- Lassa Fever
- Coronavirus

ebosursy



MINISTRE DE L'AGRICULTURE,
DE L'ELEVAGE ET DE LA PECHE

DIRECTION GENERALE
DE L'ELEVAGE

/04-A. Foraging behaviour



Hypsignathus monstrosus
Republic of Congo :
28 ind. (adult ♂) in 2020

Ms. Elodie
Schloesing



RESEARCH ARTICLE

Ecology and Evolution WILEY

Foraging and mating behaviors of *Hypsignathus monstrosus* at the bat-human interface in a central African rainforest

Elodie Schloesing^{1,2,3,4,5} | Alexandre Caron^{2,6} | Rémi Chambon⁷ | Nicolas Courbin⁸ | Morgane Labadie^{1,2,3,4,5} | Roch Nina⁴ | Frida Mouiti Mbadina⁵ | Wilfrid Ngoubili³ | Danficy Sandiala³ | Mathieu Bourgairel^{2,9} | Hélène M. De Nys^{2,9} | Julien Cappelle²

Schloesing et al., (2023)

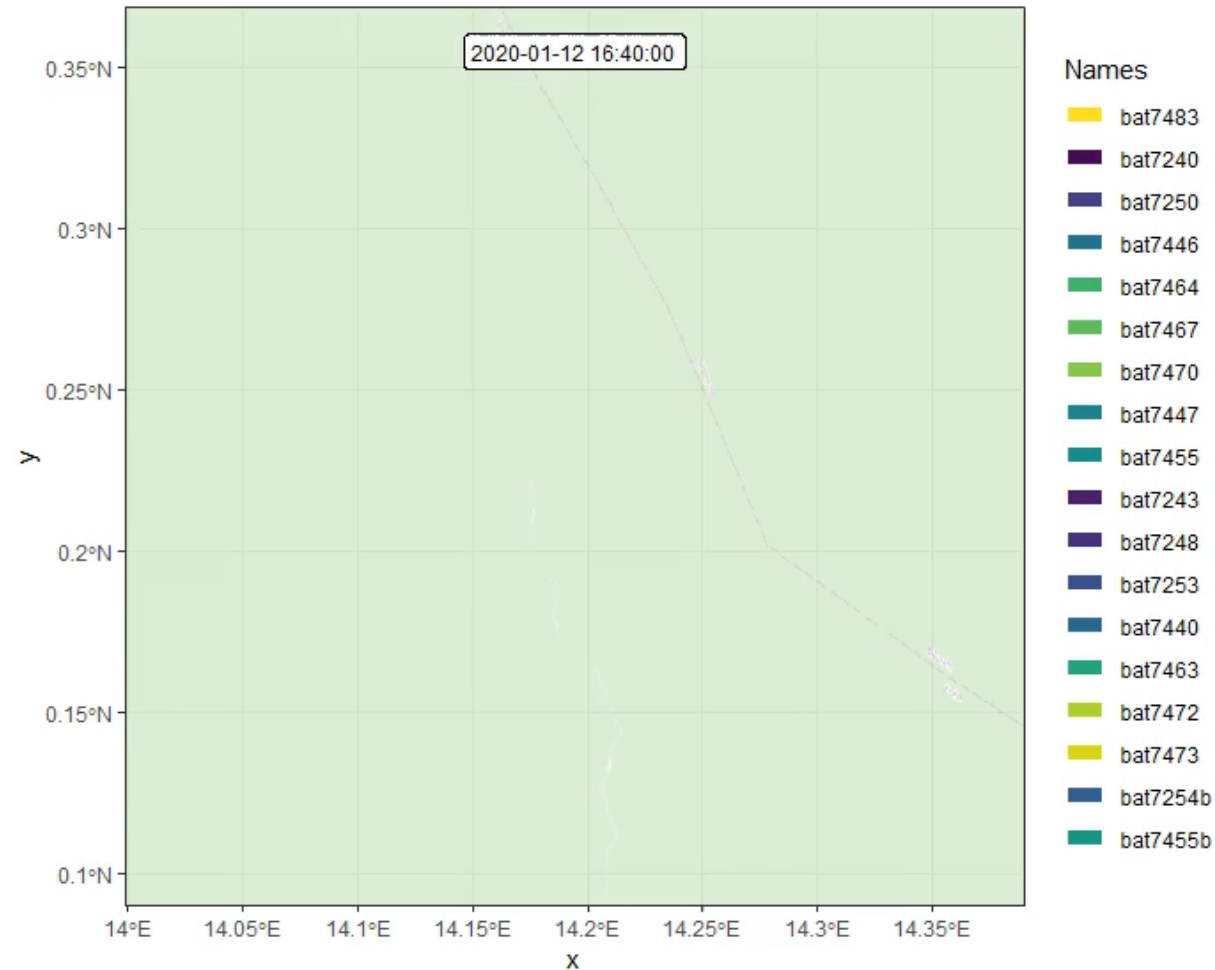
/04-A. Foraging behaviour



Republic of Congo :

Visualization of GPS
tracking data for 18
individuals

(1 GPS point every 5
minutes)

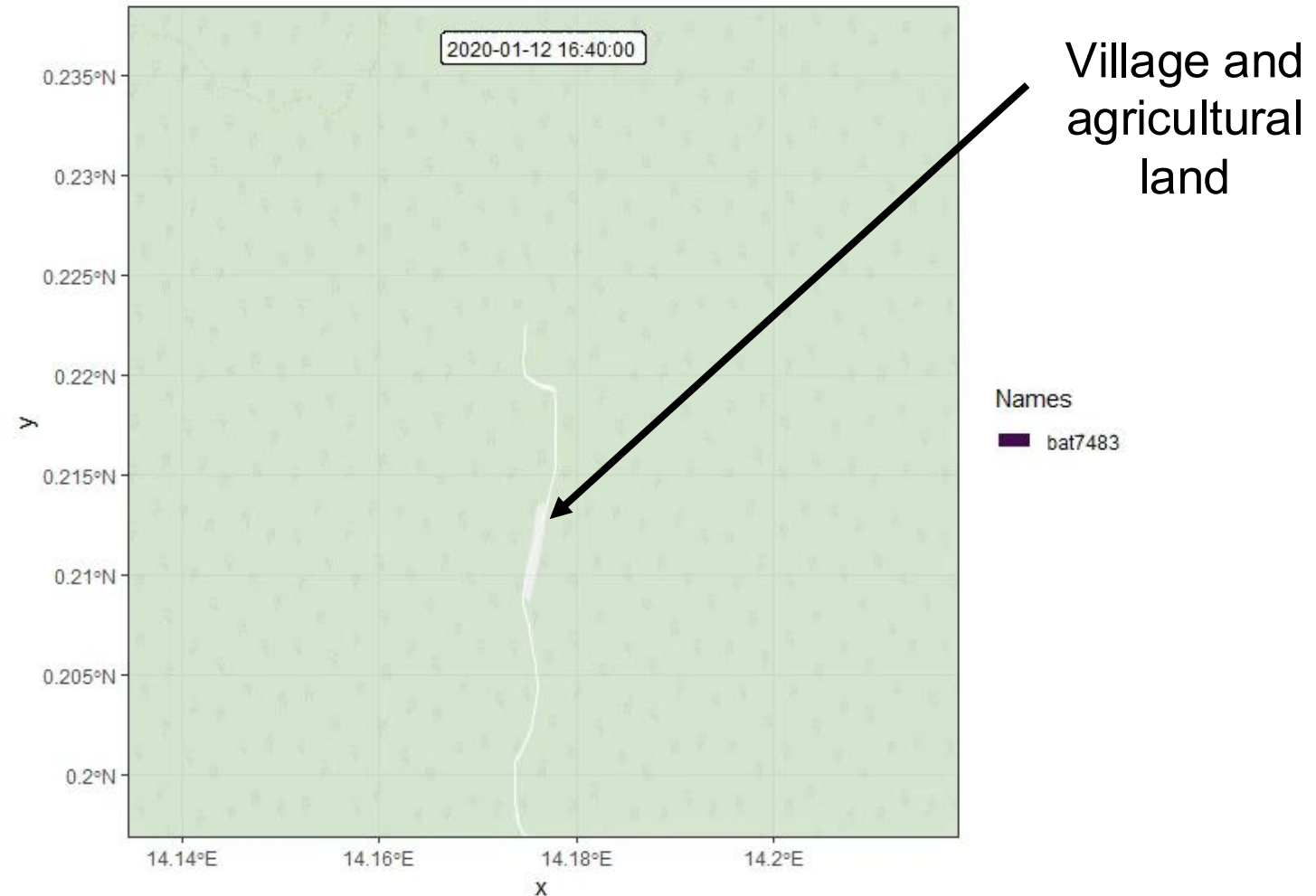


/04-A. Foraging behaviour



Republic of Congo :

Visualisation of GPS tracking data for an individual in the vicinity of a forest village (white square)



/04-A. Foraging behaviour



Republic of Congo : Foraging behaviour

Preference: +++ Agricultural land vs Forest



Parasolier tree
(*Musanga cecropioides*)



Fig Tree
(*Ficus mucuso*)
8% des patchs



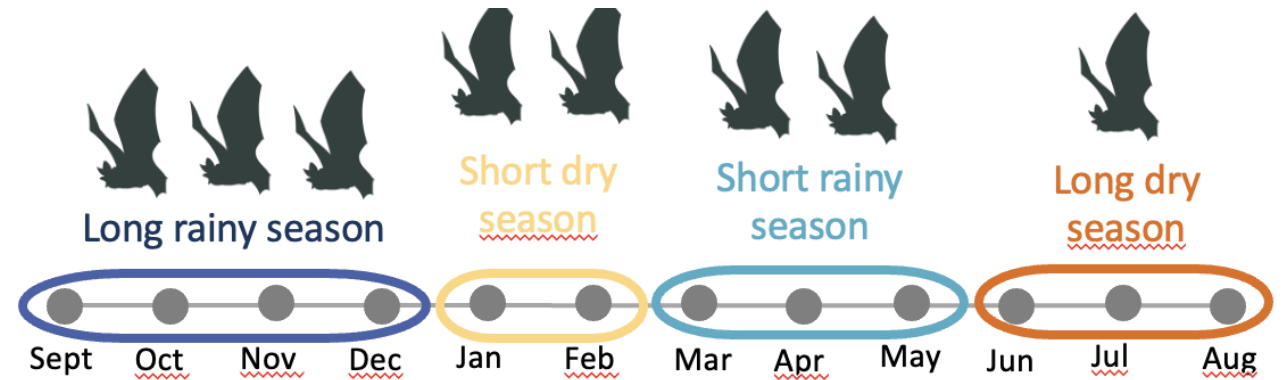
Water Liana
(*Cissus dinklagei*)
8% des patchs



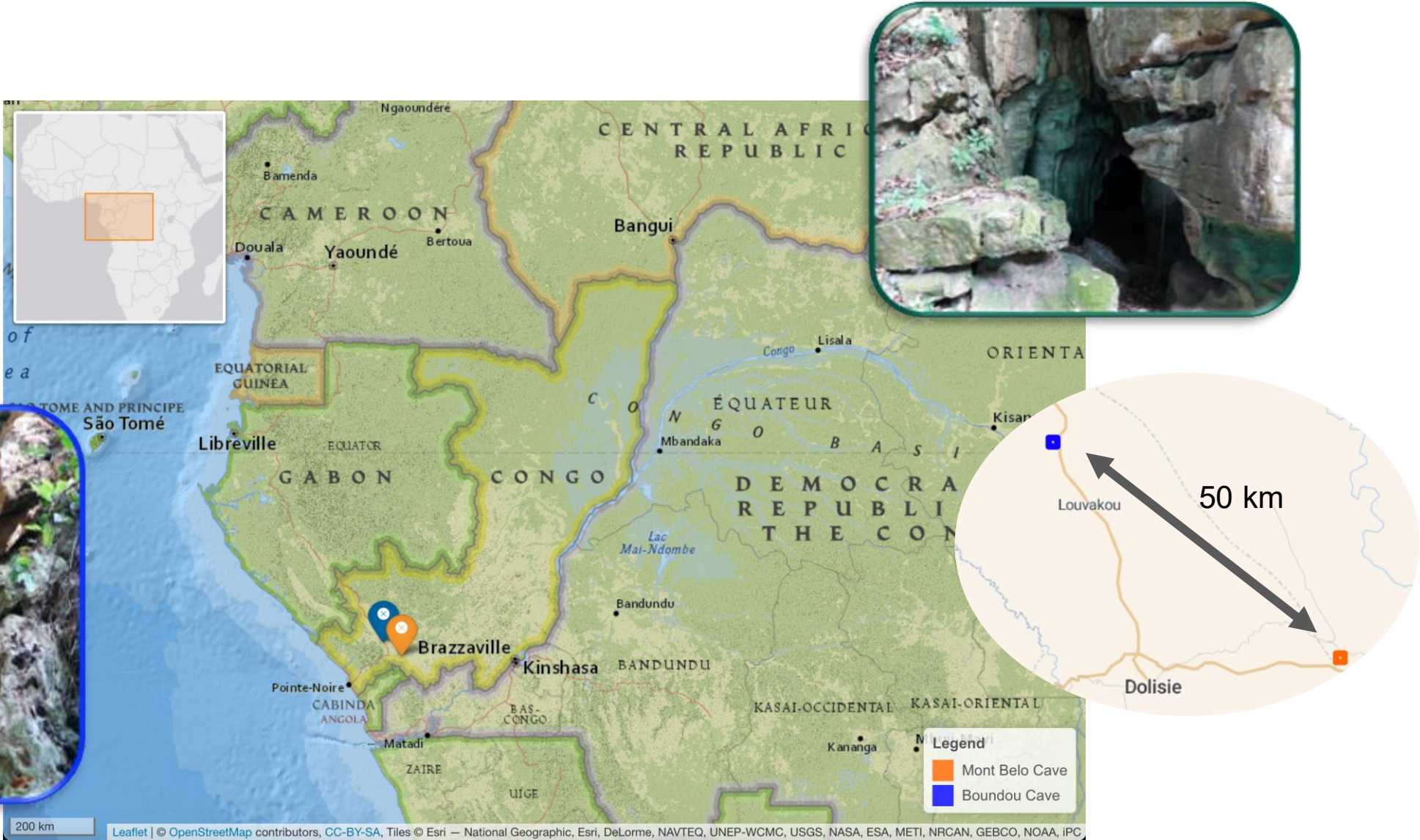
Macaranga
(*Macaranga barteri*)
5% des patchs

Found in 41% of the patchs visited

/04-B. Bat – wildlife – human interface



/04-B. Bat – wildlife – human interface



/04-B. Bat – wildlife – human interface



/04-B. Bat – wildlife – human interface

	Activities	Boundou cave	Mont Belo cave
	Research	88.7 %	27 %
	Prayers	0 %	38.8 %
	Other	11.3 %	22.8 %
	Bat hunting	0 %	6.7 %
	Guano collection	0 %	4.7%



< BIODIVERSITY AND CONSERVATION

Habitat sharing and interspecies interactions in caves used by bats in the Republic of Congo

Research Article Animal Behavior Biodiversity Ecology Zoology

Share

[Morgane Labadie](#)¹, [Serge Morand](#)^{2,3}, [Mathieu Bourquard](#)^{1,4}, [Fabien Roch Niam](#)⁵, [Guytrich Fanel Nguilli](#)⁶, [N'Kaya Tob](#)⁶, [Alexandre Caron](#)^{1,7}, [Helene De Nys](#)^{1,4}

Published January 9, 2025

/05. Perspectives

ZOOSURSY
PROJECT

Improving knowledge and strengthening capacities of surveillance systems for priority emerging and re-emerging zoonotic diseases at the animal-human-environment interfaces



Emerging and re-emerging zoonoses



Emerging zoonotic diseases come from animals and cross the species barrier to adapt to humans

Main pathogens of focus

- Anthrax
- Haemorrhagic fevers (Ebola, Marburg, FHCC, Rift Valley Fever, Yellow Fever, Hantavirus...)
- High pathogenicity avian influenza (HPAI)
- Mpox
- Other

Strengthening sustainable, risk-informed One Health prevention and preparedness for priority zoonotic threats across Africa

/05. Perspectives

Objectives

1 Improve One Health collaboration in zoonotic disease prevention



Enhance diagnostic, surveillance and multi-sectoral investigation capacities



Strengthen skills of Pandemic Prevention, Preparedness and Response (PPPR)



Strengthen capacities for One Health coordination

Project coordinator:



World Organisation
for Animal Health

2 Improve design and implementation of policies for animal health surveillance



Improve policies for more efficient and integrated surveillance systems

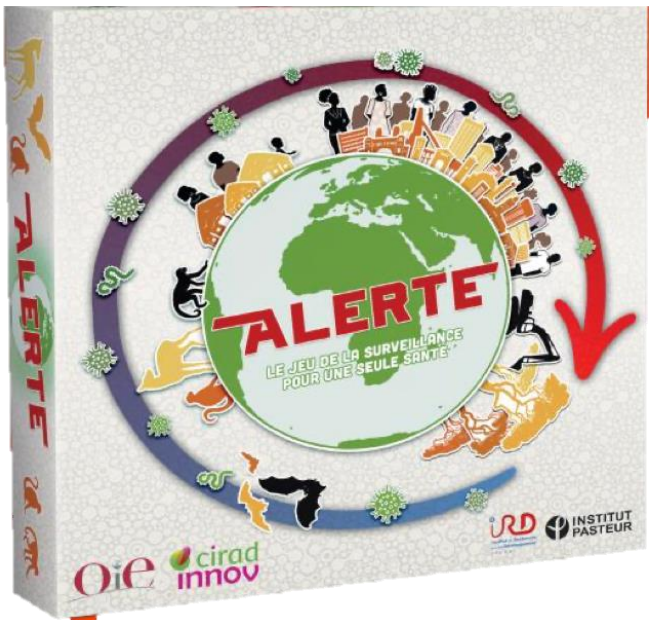
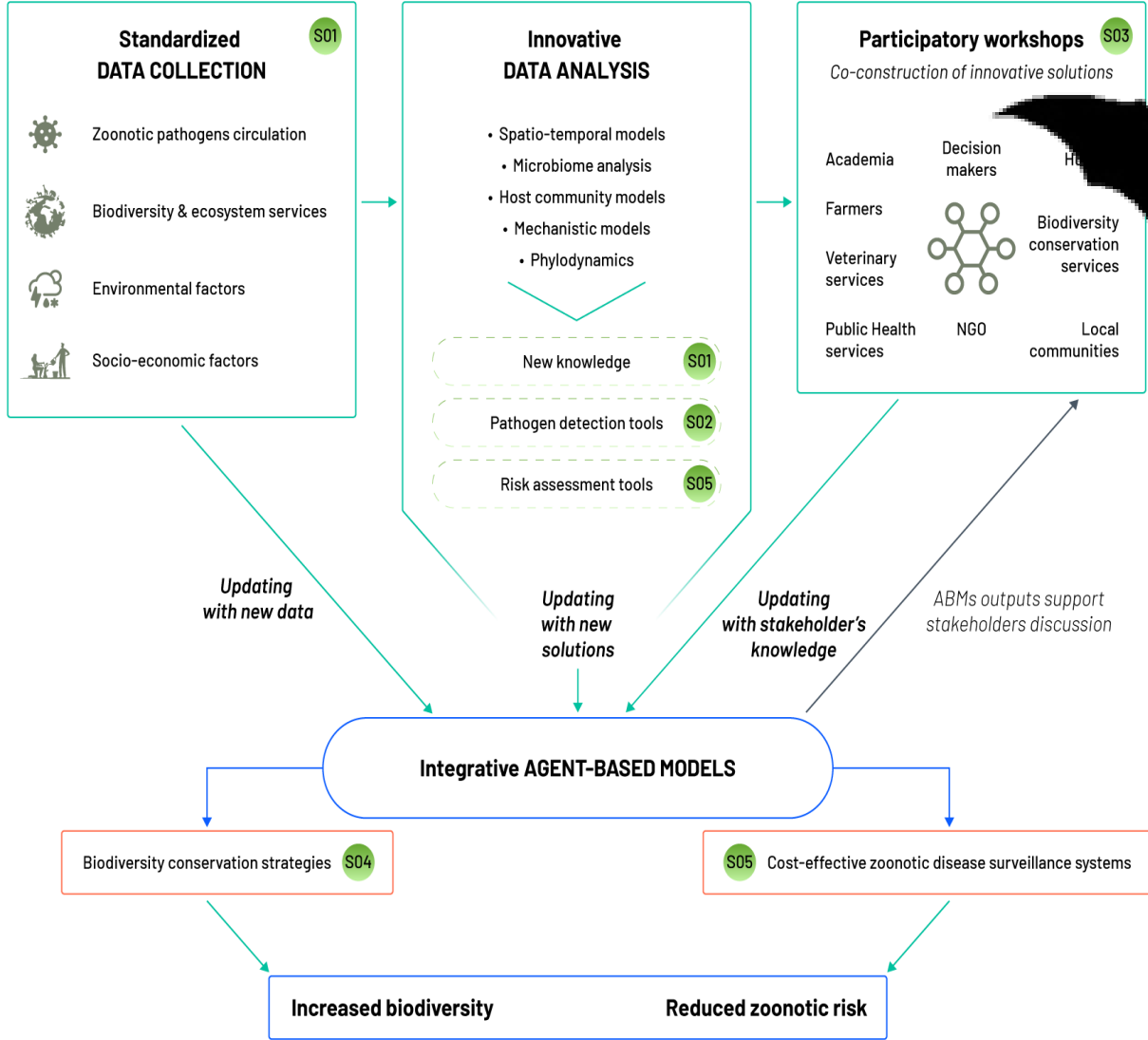


Improve legal and administrative frameworks through appropriate capacity building

In partnership with:



/06. Conclusion



BUSHMEAT

BUSHMEAT Precautions

ebo
SURSY

UNDERSTANDING DISEASE RISKS

Infected wild animals in direct or indirect contact with humans can infect them with serious diseases.

Even if a virus-infected animal does not get sick or show identifiable signs of illness, it can still infect other animals and people.

Animals like gorillas, chimpanzees, duiker antelopes and bats pose a greater risk of transmitting certain serious diseases like viral haemorrhagic fevers.

UNDERSTANDING THE RISKS

Humans can be infected by diseases of animal origin by handling or eating contaminated bushmeat as well as through direct contact with the blood or other bodily fluids of infected animals.

Do not consume dishes made with animal blood or raw or undercooked bushmeat.

Animal carcasses, especially wildlife that died of unknown causes, can still transmit diseases.

Thank you

CIRAD

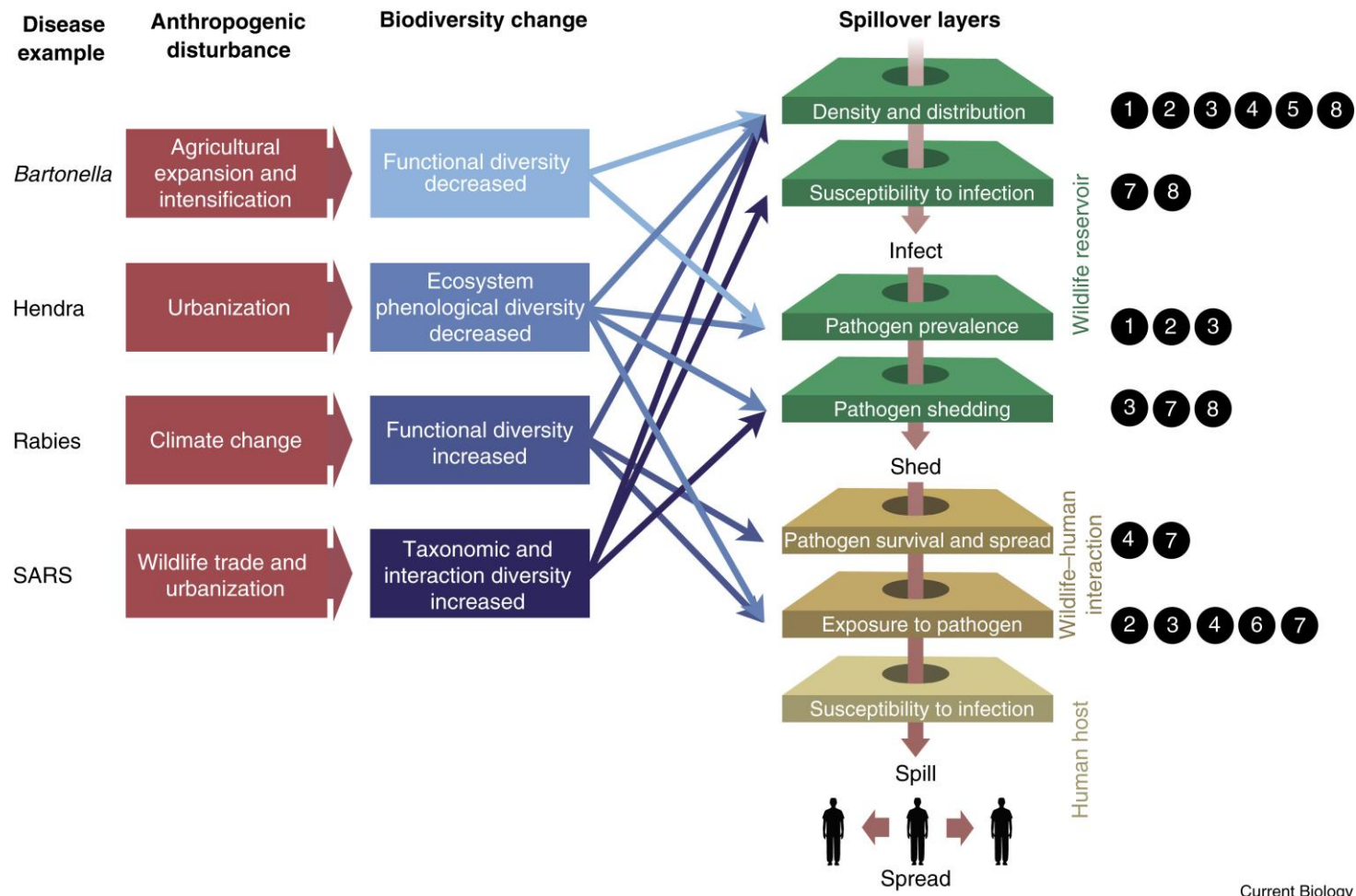
www.bcoming.eu

<https://rrafrica.woah.org/en/projects/>

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/01. Context



Current Biology

/04-B. Bat – wildlife – human interface

